North Carolina Department of Public Instruction
INSTRUCTIONAL SUPPORT TOOLS
FOR ACHIEVING NEW STANDARDS

This document is designed to assist North Carolina educators in effective instruction of the new Common Core State and/or North Carolina Essential Standards (Standard Course of Study) in order to increase student achievement. NCDPI staff are continually updating and improving instructional tools to better serve teachers.

Unpacking Standards Appendix A: Glossary of Terms For Teachers

What is the purpose of this tool?
This tool provides educators with terminologies that represent the big, powerful concepts and ideas teachers need to know and understand in order to effectively teach the new Common Core State and North Carolina Essential Standards and use supporting materials. The Glossary of Terms is not meant to be exhaustive, but seeks to address critical terms and definitions essential in building content knowledge and understanding but also in promoting consistency across disciplines, increased student outcomes, and improved parent communication. This is a living document and will undergo additions in terms over time.

How do I send Feedback?
We intend the explanations and examples in this document to be helpful and specific. That said, we believe that as this document is used, educators will find ways in which the tool can be improved and made even more useful. If there are terms which are either omitted or which you feel are misrepresented in this glossary, please send feedback to us at feedback@dpi.nc.gov and we will use your input to refine our instructional tool. Thank You!

Where are the new Common Core State and North Carolina Essential Standards?
All standards are located at http://www.ncpublicschools.org/acre/

K-5 Science Glossary of Terminology

alike Having close resemblance
http://www.thefreedictionary.com/alike

absorbed The loss of light as it passes through a material, generally due to its conversion to other energy forms (usually heat). http://www.optics4kids.org/Home/Terms/General.aspx

adapt The adjustment or changes in behavior, physiology, and structure of an organism to become more suited to an environment. http://nationalacademies.org/evolution/Definitions.html

behavior The actions displayed by an organism in response to its environment. http://dictionary.reference.com/science/behavior

characteristics (structure, growth, changes, movement, basic needs) A distinguishing feature or attribute of an item, person, phenomenon, etc. http://www.businessdictionary.com/definition/characteristic.html

consumers an organism that eats other organisms to obtain energy rather than producing its food through photosynthesis
http://estuaries.noaa.gov/Resources/Default.aspx?ID=136#C

decomposers an organism that feeds on and breaks down dead plant or animal matter, thus making organic nutrients available to the ecosystem
http://estuaries.noaa.gov/Resources/Default.aspx?ID=136#D

different unlike in form, quality, amount, or nature
http://www.thefreedictionary.com/different

direction the line along which anything lies, faces, moves, etc., with reference to the point or region toward which it is directed http://dictionary.reference.com/browse/direction

ecosystems the biotic community and its abiotic environment. http://estuaries.noaa.gov/Resources/Default.aspx?ID=136#E

energy is the ability to do work and comes in different forms http://www.eia.gov/kids/energy.cfm?page=about_home-basics

environment All of the biotic and abiotic factors that act on an organism, population, or ecological community and influence its survival and development.
http://dictionary.reference.com/science/environment

force A push or a pull exerted on an object
http://www.discoveryeducation.com/teachers/free-lesson-plans/rules-of-forces-and-motion.cfm#voc

gases flow and do not have their own shape at a given temperature, gases can take the shape of their containers http://www.brainpopjr.com/science/matter/solidsliquidsandgases/grownups.weml

gravity The natural force that attracts any two objects with mass toward each other http://www.discoveryeducation.com/teachers/free-lesson-plans/rules-of-forces-and-motion.cfm#voc

inherit(ance) The process by which traits or characteristics pass from parents to offspring through the genes. http://dictionary.reference.com/science/in+heritance

interdependence the dependence of every form of life on other living things and on the natural resources in its environment, such as air, soil, and water http://kids.britannica.com/comptons/article-273213/ecology

light radiant electromagnetic energy that an observer can see http://www.eia.gov/kids/energy.cfm?page=kids_glossary#L

likenesses trait http://learn.genetics.utah.edu/content/begin/traits/

materials(clay, wood, cloth, paper) The substance of which a thing is made or composed http://dictionary.reference.com/browse/material

matter is anything made of atoms and molecules. Matter is anything that has a mass. http://www.chem4kids.com/files/matter_intro.html

motion (straight, zigzag, round and round, back and forth, fast and slow) moving or changing position http://www.physics4kids.com/files/motion_intro.html

non living anything that is not now nor has ever been alive http://www.teachersdomain.org/resource/tdc02.sci.life.colt.lp_living/

nutrients substances required by organisms in order to grow and survive such as nitrogen and phosphorus. http://estuaries.noaa.gov/Resources/Default.aspx?ID=136#N

ocean the dominant physical feature on our planet Earth—covering approximately 70% of the planet's surface. There is one ocean with many ocean basins, such as the North Pacific, South Pacific, North Atlantic, South Atlantic, Indian and Arctic. http://oceanservice.noaa.gov/education/literacy.html

organism a living thing, such as animal, plant or micro-organism, that is capable of reproduction, growth and maintenance. http://estuaries.noaa.gov/Resources/Default.aspx?ID=136#O

population A group of organisms of the same species that are in close enough proximity to allow them to interbreed. http://nationalacademies.org/evolution/Definitions.html

properties Characteristics that can be observed or measured http://www.harcourtschool.com/glossary/science/index5.html

producer organism that creates energy-rich compounds from sunlight (through photosynthesis) http://estuaries.noaa.gov/Resources/Default.aspx?ID=136#P

recycling The process of converting materials that are no longer useful as designed or intended into a new product. http://www.eia.gov/kids/energy.cfm?page=kids_glossary#R

relative position A point defined with reference to another position, either fixed or moving; the coordinates of such a point are usually bearing, true or relative, and distance from an identified reference point. http://encyclopedia2.thefreedictionary.com/relative+position

senses any of the faculties, as sight, hearing, smell, taste, or touch, which humans and animals perceive stimuli originating from outside or inside the body http://dictionary.reference.com/browse/sense

space the amount of room an organism needs to survive and reproduce http://michigansaf.org/forestinfo/MSUElibrary/HabitatMUCC.PDF -resource needed by all organisms http://estuaries.noaa.gov/Resources/Default.aspx?ID=136#S

Sun's energy released as shortwave light and ultraviolet energy. When it reaches the Earth, some is reflected back to space by clouds, some is absorbed by the atmosphere, and some is absorbed at the Earth's surface. http://www.srh.weather.gov/jetstream/atmos/energy.htm

temperature important abiotic factor affecting distribution and abundance of organisms; influences metabolic rate and affects rates of growth and reproduction http://estuaries.noaa.gov/Resources/Default.aspx?ID=136#T

variation A modification in structure , form or function in an organism, deviating from other organisms of the same species or group. http://www.biology-online.org/dictionary/Variation

vitamins Any of various organic compounds that are needed in small amounts for normal growth and activity of the body. Most vitamins cannot be synthesized by the body, but are found naturally in foods obtained from plants and animals. http://dictionary.reference.com/science/vitamin

water cycle the recycling of water between the earth and the atmosphere http://estuaries.noaa.gov/Resources/Default.aspx?ID=136#W

weather The state of the atmosphere at a particular time and place. Weather is described in terms of variable conditions such as temperature, humidity, wind velocity, precipitation, and barometric pressure. http://dictionary.reference.com/science/weather

weathering involves two processes that often work in concert to decompose rocks. Both processes occur in place. No movement is involved in weathering. http://geomaps.wr.usgs.gov/parks/misc/gweaero.html

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adaptation- any alteration in the structure or function of an organism or any of its parts that results from naturalselection and by which the organism becomes betterfitted to survive and multiply in its environment; the ability of a species to survive in a particular ecological niche, especially because of alterations of form of behavior brought about through natural selection.
www.dictionary.com

barycenter- the point between two objects where they balance each other (For example, it is the center of mass where two or more celestial bodies orbit each other. When a moon orbits a planet, or a planet orbits a star, both bodies are actually orbiting around a point that lies outside the center of the primary (the larger body). For example, the moon does not orbit the exact center of the Earth, but a point on a line between the Earth and the Moon approximately 1,710 km below the surface of the Earth, where their respective masses balance. This is the point about which the Earth and Moon orbit as they travel around the Sun.
http://library.thinkquest.org/29033/begin/earthsunmoon.htm

biodiversity- The variety and variability among living organisms and the ecosystems in which they occur. Biodiversity includes the number of different items and their relative frequencies; these items are organized at many levels, ranging from complete ecosystems to the biochemical structures that are the molecular basis of heredity. Thus, the term biodiversity encompasses expressions of the relative abundances of different ecosystems, species, and genes.
http://www.epa.gov/reva/glossary.html

bioindicators- A bioindicator is a plant or animal species that is known to be particularly tolerant or sensitive to pollution. Based on the known association of an organism with a particular type or intensity of pollution, the presence of the organism can be used as a tool to indicate polluted conditions relative to unimpacted reference conditions. Sometimes a set of species or the structure and function of an entire biological community may function as a bioindicator. In assessing the impacts of pollution, bioindicators are frequently used to evaluate the "health" of an impacted ecosystem relative to a reference area or reference conditions. Field-based, site-specific environmental evaluations based on the bioindicator approach generally are complemented with laboratory studies of toxicity testing and bioassay experiments.
www.encyclopedia.com

boiling point- the temperature at which a liquid changes to a vapor or gas. This temperature stays the same until all the liquid has vaporized. As the temperature of a liquid rises, the pressure of escaping vapor also rises, and at the boiling point the pressure of the escaping vapor is equal to that exerted on the liquid by the surrounding air, causing bubbles to form. Typically boiling points are measured at sea level. At higher altitudes, where atmospheric pressure is lower, boiling points are lower. The boiling point of water at sea level is 100°C (212°F), while at the top of Mount Everest it is 71°C (159.8°F).
Supplement

Boiling occurs at a specific temperature for a given pressure. Evaporation can occur at any temperature below the boiling point as surface molecules gain enough kinetic energy from collisions with air molecules to change to a vapor or gas. The term *vapor* is used to indicate that a substance is a solid or liquid under normal conditions- i.e., Water is either a solid or liquid at standard temperature (0^{o}C) and pressure (760mmHg or 1.0 atm) so we talk about water vapor. Oxygen is at gas under normal conditions and is not referred to as vapor.
http://www.thefreedictionary.com/boiling+point

classification- the assignment of organisms to groups within asystem of categories distinguished by structure, origin, etc. The usual series of categories is *phylum* (or, especially in botany, *division*), *class*, *order*, *family*, *genus*, *species*, and *variety*.
http://dictionary.reference.com/

competition- the struggle between individuals of the same or different species for food, space, light, etc, when these are inadequate to supply the needs of all
http://dictionary.reference.com/

conservation laws- (includes conservation of mass, matter, energy, momentum, and charge)
In physics, the principle that certain quantities within an isolated system do not change over time. When a substance in an isolated system changes phase, the total amount of mass does not change. When energy is changed from one form to another in an isolated system, there is no change in the total amount of energy. When a transfer of momentum occurs in an isolated system, the total amount of momentum is conserved. The same is true for electric charge in a system: charge lost by one particle is gained by another. Conservation laws make it possible to predict the macroscopic behavior of a system without having to consider the microscopic details of a physical process or chemical reaction.
http://www.answers.com/topic/conservation-law

ecosystem- The combined physical and biological components of an environment; A system that includes all living (biotic factors) in a an area as well as its physical environment (abiotic factors) functioning together as a unit.
http://www.biology-online.org/

evolution- The change in genetic composition of population over successive generations, which may be caused by natural selection, inbreeding, hybridization, or mutation; The sequence of events depicting the evolutionary development of a species or of a group of related organisms; phylogeny.
Supplement
In order for evolution to occur, there must be genetic variation. Genetic variation brings about evolution. Without it there will be no evolution. There are two major mechanisms that drive evolution. First is *natural selection*. Individuals with advantageous traits are more likely to reproduce successfully, passing these traits to the next generation. This kind of evolution driven by natural selection is called adaptive evolution. Another

mechanism involves genetic drift, which produces random changes in the frequency of traits in a population. Evolution that arises from genetic drift is called *neutral evolution*.
http://www.biology-online.org/

free-body diagram- a pictorial representation often used by physicists and engineers to analyze the forces acting on a free body. It shows all contact and non-contact forces acting on the body.
http://encyclopedia.thefreedictionary.com/free+body+diagram

heat- a form of energy associated with the motion of atoms or molecules and capable of being transmitted through solid and fluid media by conduction, through fluid media by convection, and through empty space by radiation; the transfer of energy from one body to another as a result of a difference in temperature or a change in phase.
http://www.thefreedictionary.com/

incomplete dominance- A kind of dominance occurring in heterozygotes in which the dominant allele is only partially expressed, and usually resulting in an offspring with an intermediatephenotype.
Supplement
In *incomplete dominance*, a heterozygous organism carrying two alleles wherein one is dominant and the other one is recessive, (e.g. Aa), the dominant allele will only be partially expressed. Hence, the heterozygote (Aa) will have an intermediate phenotype. A typical example is the color of the flower in which *R* symbolizes the dominant allele for red pigment and *r* is the recessive allele for no pigment. In incomplete dominance, the heterozygous plant carrying both alleles, Rr, will not be able to produce enough red pigment (since the dominant allele is only partially expressed) and therefore will appear pink.
http://www.biology-online.org/

impulse- the product obtained by multiplying the average value of a force by the time during which it acts. The impulse equals the change in momentum produced by the force in this time interval.
http://www.thefreedictionary.com/

interparticle forces- These are forces that exist between two or more atoms/molecules. They include chemical bonds and van der Waals interactions (dipole-dipole interactions, “hydrogen bonding,” and London dispersion forces). In this usage, the term *interparticle forces,* encompasses what are traditionally known as intramolecular and intermolecular forces.
www.physlink.com/education/askexperts/ae206.cfm
antione.frostburg.edu/chem/senese/101/liquids/faq/h_bonding_vs_london_forces.shtml
www.cabrillo.edu/~aromero?CHEM_1A/1A_Handouts/interparticle%20forces%20(Chapter%2012).pdf

intraparticle forces- These are the forces that hold atoms together and influence their shapes. There are four, in order of decreasing strength: strong nuclear force,

electromagnetic force, weak nuclear force, and gravitational force. Strong nuclear force is responsible for attractions within the nucleus: proton-proton, proton-neutron, and neutron-neutron. It is strong enough to overcome the proton-proton repulsion caused by the electromagnetic force—which is exerted between protons. The electromagnetic force is exerted between protons (and hence the positively charged nucleus) and electrons, an attractive force that keeps the electron cloud around the nucleus. Also, electrons repel each other to the extent that the electron cloud does not collapse into the nucleus. Weak nuclear force holds sub-subatomic particles together and plays a role in radioactive decay. Gravitational force is the attractive force that any two objects that have mass exert on each other—needless to say, since the masses are infinitesmal, this is the weakest of the four forces.
http://theory.winnipeg.ca/mod_tech/node178.html
http://physicalchemistry.suite101.com/article.cfm/nuclear_binding_energy
http://answers.yahoo.com/question/index?qid=20080704005559AAINrfF

medium- an intervening substance, as air, through which a force acts or an effect is produced
http://dictionary.reference.com

melting point- The temperature at which a solid, given sufficient heat, becomes a liquid. For a given substance, the melting point of its solid form is the same as the freezing point of its liquid form, and depends on such factors as the purity of the substance and the surrounding pressure. The melting point of ice at a pressure of one atmosphere is 0°C (32°F); that of iron is 1,535°C (2,795°F). See also state of matter. Both ice and pure liquid water can exist at the melting point/freezing point. It is the temperature at which the phase change occurs when sufficient energy is either added (melting) or removed (freezing). Therefore, the freezing point and melting point of a substance is the same temperature.
http://www.thefreedictionary.com/melting+point

momentum- the product of the mass and velocity of an object (p = mv)…. It is sometimes referred to as linear momentum to distinguish it from the related subject of angular momentum. Linear momentum is a vector quantity, since it has a direction as well as a magnitude….Momentum is a conserved quantity, meaning that the total momentum of any closed system (one not affected by external forces) cannot change.
http://encyclopedia.thefreedictionary.com/momentum

natural selection- A process in nature in which organisms possessing certain genotypic characteristics that make them better adjusted to an environment tend to survive, reproduce, increase in number or frequency, and therefore, are able to transmit and perpetuate their essential genotypic qualities to succeeding generations.
Supplement
It is the process by which heritable traits that increase an organism's chances of survival and reproduction are favoured than less beneficial traits. Originally proposed by Charles Darwin, natural selection is the process that results in the evolution of organisms.

http://www.biology-online.org/

normal force- the component, perpendicular to the surface of contact, of the contact force exerted by, for example, the surface of a floor or wall, on an object, preventing the object from entering the floor or wall. In a static situation it is just enough to balance the force with which the object pushes, e.g. its weight on the floor, or a smaller force if somebody leans against a wall.
http://encyclopedia.thefreedictionary.com/Normal+force

nutation- A small, cyclic variation of the Earth's axis of rotation with a period of 18.6 years, caused by tidal forces (mostly due to the gravity of the Moon). Nutation is a small and relatively rapid oscillation of the axis superimposed on the larger and much slower oscillation known as *precession*.
http://www.thefreedictionary.com/

pedigree- A diagram showing the lineage or genealogy of an individual and all the direct ancestors, usually to analyze or follow the inheritance of trait. A *pedigree* can be used to determine the Mendelian inheritance of a genetic trait, especially familial diseases, across several generations of a family.
http://www.biology-online.org/

precession- an effect exhibited by a spinning body, as a top, when an applied torque tends to change the direction of its rotational axis, causing this axis generally to describe a cone and to turn at right angles to the direction of the torque
In astronomy- the occurrence of the equinoxes earlier in each successive sidereal year because of a slow wobble in the earth's axial spin which shifts the equinoctial points slightly westward along the ecliptic: the wobble is caused by the pull of the sun and moon on the earth's equatorial bulges and makes the poles move around a center point (axis of the ecliptic), taking about 25,800 years to return to the same orientation with the stars
http://science.yourdictionary.com/

stem cells- An unspecialized cell found in fetuses, embryos, and some adult body tissues that has the potential to develop into specialized cells or divide into other stem cells. Stem cells from fetuses or embryos can develop into any type of differentiated cells, while those found in mature tissues develop only into specific cells. Stem cells can potentially be used to replace tissue damaged or destroyed by disease or injury, but the use of embryonic stem cells for this purpose is controversial. Also called *progenitor cell*.
http://science.yourdictionary.com/